

# Letter of intent (LOI)

Interested parties should submit a Letter of Intent (LOI) on or before February 28, 2020 for each individual proposal. Letter of intent should include applicant contact information and seven questions about proposed study. More details about SAM study selection process, eligibility and funding availability can be found in SAM REF guidelines in SAM Effectiveness webpage.

Email address \*

Nigel.Pickering@wsu.edu

Applicant contact information

Applicant Full Name \*

Nigel Pickering

Organization \*

Washington Stormwater Center

Phone number \*

509-335-8624

Proposed Study Information

### 1. Proposed Study Title \*

Enhancing Basic Ditches for Improved Runoff Treatment

### 2. Which topic(s) from the SWG's priority list do you propose to address? \*

The proposed study topic should be in the SWG's priority list

14. Compare cleaned/uncleaned ditches to assess effectiveness of ditch cleaning at removing legacy pollutants. Include evaluation of likely release of pollutants AND 15. Evaluate effectiveness of ditch enhancement techniques (i.e., turning ditches in to bioswales) at removing pollutants.

### 3. Select type of project being proposed \*

- Survey
- Literature Review & Synthesis
- Environmental Sampling Study
- Other

### 4. Short Description of the Proposed Study \*

250 word limit: describe how results will assess effectiveness and advance regional understanding and permittees' implementation of specific stormwater management approaches

Stormwater ditches have traditionally been used for conveyance of stormwater with some flow control benefits. Early stormwater research showed that grass swales were barely effective (10%) at removing contaminants. Bare soil ditches can be a source of contaminants because of the potential for transport of native or accumulated sediments. Although biofiltration swales are used by WSDOT and Ecology for basic treatment but are generally followed by another treatment system for improve treatment. This proposed project will investigate how existing ditches can be redesigned and retrofitted into bioswales then viable approaches will be tested by a field monitoring study in Western Washington. This project dovetails well with prior doctoral work by Jayakaran on the redesign of agricultural ditches to reduce sediment transport, Pickering's current WSDOT research on developing an improved media for phosphorus removal in biofiltration swales, and the work of other WSU faculty on the biological and physico-chemical processes for pollutant removal from stormwater.

### 5. What type information will be collected or analyzed for this proposed study? \*

If existing permittees' data are needed, specify the type, and the expected timing of a request for existing information from Permittees

The initial part of this study would include a literature review of existing swale designs and effectiveness data both for urban and agricultural areas. Using these findings, an existing basic swale in Western Washington will be selected and set up for monitoring. The swales to be monitored would include an existing swale, a hydraulically enhanced swale, and a media-enhanced swale. The swales will be set up in parallel such that the road runoff is split among them so they can be monitored for flow and water quality under exactly the same weather conditions. The existing swale and two modified swales will be instrumented and monitored over two wet seasons. The literature review and experimental design will be completed during the first year while the monitoring will occur in years two and three.

### 6. What are the anticipated measurable outcomes and key deliverables that will be produced by the proposed study, and how will they be used by Permittees and the Washington State Department of Ecology? \*

The first outcome of this work will be a review of the literature on existing swale designs and effectiveness data. The review will document the range of design approaches and the past performance of swales at other locations and for other conditions. Using this information, we will examine and develop new design criteria to retrofit an existing suitable swale. Deliverables will include a report on the findings of the literature and data review and a data report at the conclusion of the monitoring study.

### 7. Permittees or agencies you are proposing to coordinate with (provide staff names and contact information, if known) \*

Enter "NA" if not applicable.

Ecology, WSDOT (Alex Nguyen, nguyea@wsdot.wa.gov)

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